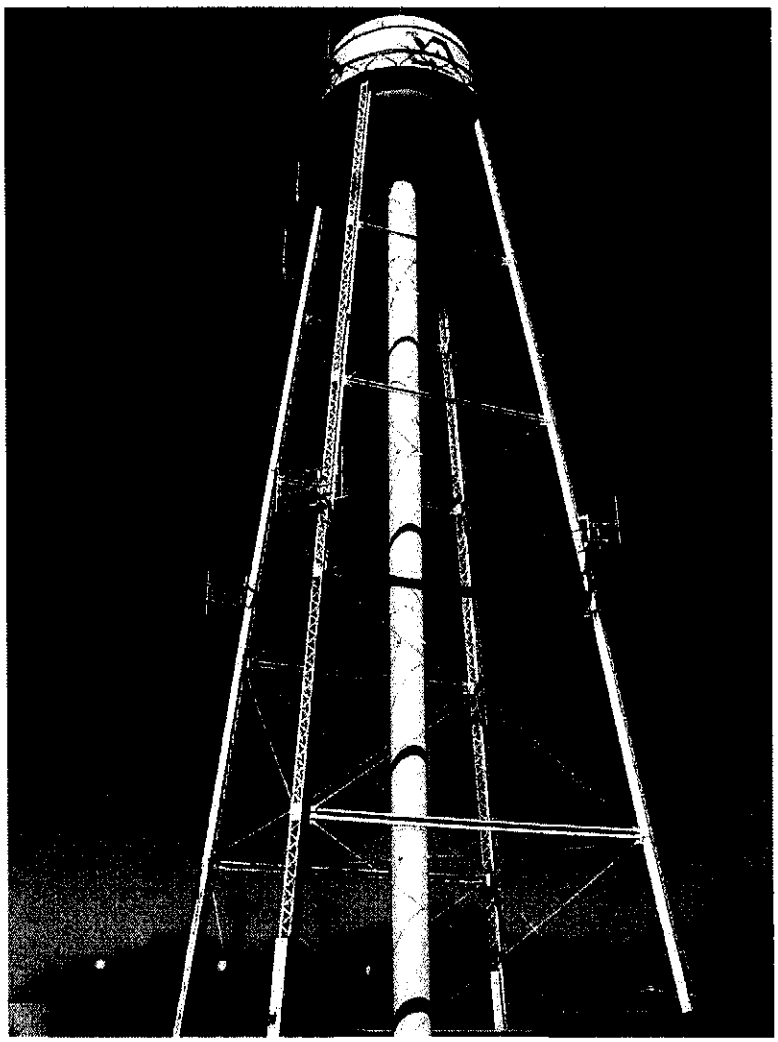
INSPECTION REPORT

100,000 GALLON DOUBLE-ELLIPSOIDAL
ELEVATED WATER STORAGE TANK

VA MEDICAL CENTER
SIOUX FALLS, SOUTH DAKOTA

May 3, 2011



Maguire Iron, Inc.

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
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JOHN P.
LONGNECKER
SOUTH DAKOTA

6/14/11

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VA MEDICAL CENTER, SIOUX FALLS, SD

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GENERAL INFORMATION

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Scope:

A. Maguire Iron, Inc., subcontractor of Red Wilk Construction, received a contract from the Army Corps of Engineers for interior renovation of the elevated water tower and appurtenant modifications for the Sioux Falls, SD VA Medical Center per solicitation No. W9128F-09-R-0029 RFP-1 dated August 13, 2010 and Amendment No. 4 dated September 22, 2010.
Included in the RFP was a line item for a structural analysis and a determination of "fit-for-service", which is the reason for this report.

B. A professional examination of the tank was performed on May 3, 2011 involving rigging and climbing of the tank. Measurements of all structural members of the tower structure and tank container were taken along with pictures and ultra-sonic tests of the tank shell and bowl areas for thickness.
Paint samples were taken from both the interior and exterior coatings of the tank and tower structure. The paint samples were submitted to a lab to be tested for the presence of lead.
The inspection/examination of the tank and tower structure was performed by Mr. Rich Kemmis, NACE Certified Coatings Inspector # 10226 and Mr. Dave Humble, NACE Coatings Inspector Level 2, and SSPC C3/C5 Certified Lead Abatement Supervisor.
All measurements and information were forwarded to Mr. John Longnecker, PE, for structural and "fit-for-service" evaluation.

Reference Standards:

The information obtained during the examination and evaluation of the elevated water tank and tower structure is compiled in this report and includes a professional examination of the interior and exterior coatings, structural members, appurtenances and overall "fit-for-service".
All areas were examined with respect to current standards AWWA D100-05 "Welded Carbon Steel Tanks for Water Storage", AWWA D102-06 "Coatings Steel Water Storage Tanks", AWWA M42 "Steel Water Storage Tanks", OSHA 29 CFR General Industry Standards, NACE International Standards, SSPC, and Federal and State Homeland Security requirements to prepare evaluation and report of conditions of the elevated water tank and tower structure.

General Tank Information:

The elevated water tank and tower structure is a lattice construction, riveted steel, double-ellipsoidal design of approximately 100,000 gallon capacity supported on four (4) columns. The tank and tower, from ground level, is approximately 190' to the top, with a tank diameter of 28'.

There is no tank identification tag on the tower. There is some welding of the riser column and the bottom of the leg bases, which appear to be "factory" welding, indicating a construction timeframe of the late 1940's to the early 1950's. Observation of the balcony railing and configuration of the struts are an indication that the builder was Pittsburgh-Des Moines Steel Company. In conversation with a VA employee, it was expressed that the individual had seen an old plan indicating the tank was built in 1949, which is congruent with the visual assessment.

WATER STORAGE TANK
And
TOWER REPORT

WATER STORAGE TANK and TOWER REPORT

Exterior and Interior Coatings:

A. The **exterior** coating condition is poor. The coating appears to be an alkyd type paint of unknown manufacture, with multiple areas of paint failure, fractured coating, rusting of underlying steel and overall poor condition. The areas include the roof, balcony and railing, and the complete tower structure including all legs, struts, windage rods, ladders and cages, and all appurtenances. It appears that the tank shell and bowl areas may have been sandblasted in the past as they are generally in better condition than the majority of the tank and tower structure.
Dry Film Thickness (DFT) of the exterior coating was measured according to SSPC-PA2 "Measurement of Dry Paint Thickness with Magnetic Gages" with a high reading of 16.7 mils, a low reading of 3.5 mils, and an average of 9.0 mils.
The overall adhesion of the existing paint, as can be seen, is poor.
The results of the lab tests, of the exterior paint samples, indicate the presence of lead, most likely in the existing primer on the tank. The level of lead is reported at 159,000 ppm, which is over the action limit of 5000 ppm. A copy of the lab analysis is included in this report.

B. The **interior** coating is in poor condition. According to old information, the interior of the tank was last sandblasted and coated in 1986 with a coal-tar base epoxy paint manufactured by the Tnemec Company.
There are many large area coating failures visible on the tank roof, knuckle, shell and bowl areas, with an overall coating failure of approximately 35% - 40% of the tank. There are also visible, large areas of the bottom shell ring and the bowl area with considerable runs and sags in the coating.
There is considerable rusting in tank roof, knuckle, shell and bowl areas of the tank with some minor pitting occurring measuring less than 1/16" with a standard pit depth gage. There are also some shell and belly seam areas which are also rusting and pitting out.
There is evidence of old pit repairs in the bottom ring of the shell and the bowl area of the tank. Some of these pit repairs have small to large failures in the coating.
There are the remainders of an old cathodic protection system, hand holds and wiring. There are also old couplings in the roof knuckle from past rigging.
The wet riser column, which was not drained completely, appears to be in fair condition but has numerous runs in the coating. There are paint failures and rusting occurring on the rivet seams of the riser. Observations in the pit indicate an 8" riser inlet pipe and a 4" drain valve, which was not functioning.
Dry Film Thickness (DFT) measurements of the interior coating were from a high reading of 36.9 mils to a low reading of 8.0 mils with an average of 19.3 mils, which is high due to the runs and sags in the coating

APPURTENANCES:

A. **Exterior Ladders:** The tanks leg column ladder is riveted and bolted securely to the leg. The ladder dimensions are 2" x 5/16" flat side rails, 3/4" round rungs 12" on center, 14 1/2" wide and 7" plus toe clearance. The shell ladder is the same dimensions as the leg ladder and is secured with rivets and bolts. The roof ladder dimensions are 2" x 2" x 1/4" angle side rails, 3/4" round rungs 12" on center, 14 1/2" wide. The roof ladder is rolling design, with a pivot on the tank vent and secured by bolts. A functional safety climb, cable device is attached for fall protection to the leg, shell and roof ladders. The leg and shell ladders are equipped with a cage made up of 2" x 1/4" flat, and are not legal for safety. The ladders **do not comply** with current OSHA safety standards, which require the ladders to be fixed and fabricated of 2" x 3/8" flat side rails, 3/4" rungs on 12" centers, 16" width, and 7" toe clearance.

B. **Accesses:** The tank has one 24" round, roof access hatch with a 3 1/2" curb and lid with a 2" overlap. The tank also has one 16" x 12" oval design, riser man way. These hatches both **do not comply** with current AWWA and OSHA requirements. Additionally, in order to comply with current standards for confined space entry, this tank requires two (2) additional accesses, an additional one in the tank roof and an additional one at the bottom of the wet riser.

C. **Vent:** The tank is equipped with a 6" "ball" type vent/finial with cut-out slots and screen for venting and keeping debris out of the tank, located at the center of the roof. One of the screens is missing, which could allow bird entry into the tank. The vent **does not comply** with AWWA standards which require a fail-safe, frost-proof design of sufficient capacity. The 6" size of the vent is smaller than the 8" feed of the inlet pipe, and would not be able to vent the tank properly in the event of a full clean break of the inlet/outlet pipe.

D. **Overflow:** The tank is equipped with a 4" overflow pipe and funnel type inlet on the interior of the tank. The pipe discharges at approximately 12' above the balcony girder/floor, and has a plastic grate over the end. The overflow pipe **does not comply** with AWWA standards which require the pipe run to approximately within 24" of the ground and have a screen and/or a flap gate at the discharge.

E. **Balcony:** The tank balcony and railing is riveted and bolted securely to the tank. The V-type configured balcony measures 24" wide with an original top rail measurement of 36" and a toe board of 4". The balcony railing has been modified in the past and **complies** with OSHA standards for safety.

F. **Wet Riser Column:** The wet riser has a diameter of 5' x 159' with one (1) 8" small diameter inlet/outlet pipe. The riser column also has a 4" drain valve located in the bottom of the column and is non-functioning.
Additionally, the top opening of the riser column, in the tank, has a grate, which has been cut out and has lifted off of the riser opening. The existing grate **does not comply** with OSHA standards for safety.

STRUCTURAL:

A. The concrete foundations appear to be in good condition with no cracking, spalling or exposed aggregate. The anchor bolts of the leg columns (two per leg) connecting the leg columns to the foundations are tightly secured and in good condition. There is normal, minor rust staining of the anchors bolts.

B. The diagonal windage rods and riser column rods overall appear to be tightly secured and straight with no metal loss observed. However, there are several riser rods and windage rods that need to be checked for tightness. Although there is considerable paint failures, the bolt connections, turnbuckles, wing plates and strut-to-column connections are tight, structurally sound with no observable metal loss.

C. The elevated water tank is supported on four (4) lattice construction, riveted, columns. The legs, which are battered (angled), are made up of two (2) 15" x 3 1/2" channels, cross tied with 2 1/4" x 3/8" flats. The leg columns are properly aligned with no settling observed at the foundations or leg column bottom plate.

D. The tower structure has five (5) struts, including a "ground" strut. A "ground" strut is typically installed for poor soils and/or exceptional wind loading for a tall structure.

SUMMARY REPORT

SUMMARY REPORT

Summary:

A. It is my opinion, based on observation and measurements, along with the engineers report, that **this tank is structurally sound and "Fit-for-Service".** The checking and tightening of the windage and riser rods is included in the scope of work that is soon to progress under current contract.

B. The interior coating of the tank should be completely removed and recoated. According to AWWA recommendations, any time an interior coating shows overall, more than 10% coating failure, it is not practical to perform remedial touch-up repairs. The existing coating, which is approximately 25 years old, is beyond its useful life, and coal tar base epoxy coatings are no longer an approved coating for potable water. Under current contract, the interior is to be completely recoated.

C. The exterior coating of the tank is in poor condition at this time and should be completely removed by sandblasting and recoated with a zinc primer, and either an epoxy/urethane system or an acrylic system, intermediate and finish coats. Due to the presence of lead in the existing paint and location of the structure, the exterior painting will require full containment and lead abatement procedures.
The exterior painting is not included in our current contract and it is our understanding that the work is being specified and bid in the near future by the Sioux Falls VA Medical Center.

D. All of the appurtenant upgrades should be performed to ensure that the tank is operating in a safe and sanitary condition. These would include new ladders, two additional tank accesses, new tank vent, new overflow pipe, and new riser grating. The changes and modifications for the appurtenances are to be done under current contract.

Respectfully Submitted
Richard Kemmis, NACE Certified Coatings Inspector #10226
Maguire Iron, Inc.

STRUCTURAL ANALYSIS REPORT

RAW DATA MEASURMENTS

Sioux Falls VA
Sioux Falls, South Dakota
May 3, 2011

PDM structure, approximately 1949 Approximately 100,000 gallons
Double-Ellipsoidal, Elevated Tank; Rivet Construction with some early factory welding of leg bases and riser column.
Lattice construction, 4 legs, 5 struts including 1 ground strut, wet riser, approximately 190' to top

Concrete foundations appear in good condition with no visible spalling, cracks or voids . The leg bottoms are not covered in dirt/debris, and appear in good condition. Tank structure appears true, correct and in good condition for the tanks age.

STRUCTURE INFORMATION

Legs and Leg Base:

- Legs are two channels 10" apart; channels are 15" x 3 ½" x 9/16" web
- Lattice are 2 ¼" x 3/8" x 18 ¼", center of rivet-to-center of rivet
- All rivets on entire tank and structure, (with the exception of the ground strut), are ¾" (shaft) with approximately 1 3/8" heads
- Rivets on the ground strut are 5/8" shaft with approximately 1 ¼" heads
- Bottom cross-brace rods are 1 ¼" round with 1 5/8" turnbuckle and 2 ¼" attachment pin
- Bottom cross-brace rod measurement from bottom pin to pin at first strut, diagonally is 55'6"

- Leg bottom base plate is 25 ¼" x 22" x 1 5/8" thick
- Anchor bolts are 1 5/8" with 2 5/8" outside nut, two (2) per leg
- Outside of channel, one each side, anchor angle is 6" x 6" x 5/8" thick, secured with 7 rivets
- Back of leg tie-plate is 17" x 11 ¼" x 3/8" thick, secured with 4 rivets each side
- Front of leg tie-plate is 18 ¾" x 23 ½ " x 3/8", secured with 6 rivets each side
- Strut-rod connecting plate is 19" x 10" x 3/8" thick and continues on strut connection another 7 ¼", secured with 6 rivets each side

- Ground strut is made up of two channels, Vertical member is 7" x 2" x ¼" channel out, Horizontal member (top) is 9" x 2 ½" x ¼" channel up; back of strut additional reinforcement of vertical member, 16" long; all rivets on this strut and attachment to sail plate with 5/8" rivets; secured with 12 rivets each end

- Strut length between all legs is approximately 50' 5"
- Leg-to-leg measurement at front of leg is approximately 51' 2"
- Center of leg-to-center of leg measurement is approximately 51'

- Wet riser circumference is 15'10" or 5' diameter; ¼" thick plate
- Base plate is 3/8" thick, secured with four (4) 1" anchor bolts
- Wet riser sections, (24) cans at 6'5" each, 5 rivet joints approximately 8" each, and one 18" can at the top, for a total of approximately 159'
- One boiler man way, 12" x 16" with 5/8" thick ring; two crabs with 1" bolts
- Back of leg to riser measurement is 34'3"

Second Strut number 2:

- Length of leg from top of base plate, (section 1), along the front of the leg, to joint is 33'8"
- Joint plates on side of leg are 11 ¾" x 5 ¾" x 3/8", secured with 8 rivets
- Joint plates, front and rear are 24" x 17" x 3/8", secured with 8 rivets each side
- Strut-rod connecting plate is 24" x 10 ½" x 3/8" thick and continues on strut connection another 7 ¼", secured with 8 rivets each side
- Second strut is made up of two channels, Vertical member is 10" x 2 ½" x 3/8" channel out, Horizontal member (top) is 12" x 3" x 3/8" channel up; back of strut additional reinforcement of vertical member, 16" long; secured with 12 rivets each end
- Strut length from end-to-end is 42'2"
- Second set of cross-brace rods are 1 1/8" round with 1 ½" turnbuckle and 2 ¼" attachment pin
- Needle rods from leg to riser are 5/8"

Third Strut number 3:

- Length of leg from joint, (section 2), along the front of the leg, to joint is 29'11"
- Joint plates on side of leg are 11 ¾" x 5 ¾" x 3/8", secured with 8 rivets
- Joint plates, front and rear are 24" x 17" x 3/8", secured with 8 rivets each side
- Strut-rod connecting plate is 24" x 10 ½" x 3/8" thick and continues on strut connection another 7 ¼", secured with 8 rivets each side
- Second strut is made up of two channels, Vertical member is 8" x 2 ¼" x ¼" channel out, Horizontal member (top) is 10" x 2 ½" x ¼" channel up; back of strut additional reinforcement of vertical member, 16" long; secured with 12 rivets each end
- Strut length from end-to-end is 36'2 ½"
- Third set of cross-brace rods are 1 1/8" round with 1 ½" turnbuckle and 2 ¼" attachment pin
- Needle rods from leg to riser are 5/8"

Fourth Strut number 4:

- Length of leg from joint, (section 3), along the front of the leg, to joint is 29'11"
- Joint plates on side of leg are 11 ¾" x 5 ¾" x 3/8", secured with 8 rivets
- Joint plates, front and rear are 24" x 17" x 3/8", secured with 8 rivets each side
- Strut-rod connecting plate is 24" x 10 ½" x 3/8" thick and continues on strut connection another 7 ¼", secured with 8 rivets each side
- Second strut is made up of two channels, Vertical member is 7" x 2" x 3/16" channel out, Horizontal member (top) is 8" x 2 ¼" x 3/16" channel up; back of strut additional reinforcement of vertical member, 16" long; secured with 12 rivets each end
- Strut length from end-to-end is 30'3 ½"
- Fourth set of cross-brace rods are 1 1/8" round with 1 ½" turnbuckle and 2 ¼" attachment pin
- Needle rods from leg to riser are 5/8"

Fifth Strut number 5:

- Length of leg from joint, (section 4), along the front of the leg, to joint is 29'11"
- Joint plates on side of leg are 11 ¾" x 5 ¾" x 3/8", secured with 8 rivets
- Joint plates, front and rear are 24" x 17" x 3/8", secured with 8 rivets each side
- Strut-rod connecting plate is 24" x 10 ½" x 3/8" thick and continues on strut connection another 7 ¼", secured with 8 rivets each side
- Second strut is made up of two channels, Vertical member is 6" x 1 7/8" x 3/16" channel out, Horizontal member (top) is 7" x 2" x 3/16" channel up; back of strut additional reinforcement of vertical member, 16" long; secured with 12 rivets each end
- Strut length from end-to-end is 24'4 ½"
- Fifth set of cross-brace rods are 1 1/8" round with 1 ½" turnbuckle and 2 ¼" attachment pin
- Needle rods from leg to riser are 5/8"

Balcony Girder:

- Length of leg from joint, (section 5), along the front of the leg, to balcony girder is 34'9"
- Top of leg tie-plate, front and rear, 17" x 11 ½" x 3/8", secured with 4 rivets each side
- Top of leg, rear angle tie plate 10 ¼" x 9" x 3/8", secured with 4 rivets each side
- Cross-brace rod tie-plate is 15" x 9 ½" x 3/8", secured with 6 rivets
- I-beam from leg to riser, approximately 3' below belly, 3" x 2 ½" x 3/16"

- Balcony girder support plate at top of leg, 17" x 16 ½" x 3/8", angle cut, secured on leg with 7 rivets each side; reinforced attachment with (4) angles, 2 each side, 3" x 3" x 3/16", secured with 4 rivets at angle and girder floor
- Girder bottom (floor) is ¼" x 24"
- Attachment of floor at tank shell wall is 4" x 3" x 5/16" angle
- Outside girder plate (toe board) is 8" x ½", 4" shows above floor
- Girder front plates at joint, at legs, 12" x 21 ½" x 3/8", secured with 6 rivets each side of joint; backed up by 2 ½" x 3 ½" x ¼" angle on inside of front plate

- Leg attachment to tank shell are (4) 3" x 3" x ½" angles per leg, 84 ½" overall length with 54" attachment on tank
- Each angle attaches to tank with 18 rivets, and attaches to leg channel with 25 rivets
- Leg channels continue up past balcony girder floor approximately 30"
- Leg channels joined by two angles, 4" x 6" x 3/8", 7" long

- Balcony PDM V-type, top rail is 2" x 2 ½" x ¼" angle; v-braces are 2" x 2" x 3/16" angle
- Original height 36"; has added angle to raise height to 42" and added 2" x ¼" flat, knee board
- All ladders: 2" x 5/16" flat side rails, ¾" round rungs, 14 ½" wide, 12" step
- Ladder cage is all 2" x ¼" flat
- Roof ladder is rolling type, secured

TANK INFORMATION

- Tank diameter is 28 feet; circumference of 1057" or 88'1"
- Bowl/belly and roof are ellipsoidal
- Bowl/belly of tank has 16 finger sheets with a thickness of 3/8"
- First ring of the shell is 75" high to the center of the rivet: plate is 5/16" thickness
- Second ring of the shell is 58" from the center of the 1st ring rivet to the bottom of the shell angle; plate is ¼" thickness
- Top-of-shell angle (external) is 3 ½" x 3" x 3/8"
- Roof is ¼" plate, approximately 7' deep with a running length of 14'4 ½"
- Top dollar plate is 8' diameter, ¼" thickness
- Tank interior is lined with a coal-tar epoxy, fair-to-poor condition with minor-to-average rusting
- Old and new pitting, scattered on bottom ring and top of bowl, less than 1/16" in depth
- Rivets on tank shell are approximately 2 ½" on center, and belly are approximately 2 ¼" center

1st Ring of Shell:

- Original thickness is 5/16"
- UT measurements: .312 .310 .312 .311

2nd Ring of Shell:

- Original thickness is 1/4"
- UT measurements: .250 .245 .245 .248

Appurtenances:

Roof Manway:	24" round, 3 ½" curb, 2" overlap lid, open on one side
Finial:	6" ball type with holes, screen missing on one opening
Overflow pipe:	4" discharging at top of tank shell, poor screen

Interior coating mil readings:

Belly:	25.2	20.1	36.9	32.3	23.4	21.6	22.9	37.1	21.5	17.4	22.4	21.8	19.6
Top of riser:			11.1	18.3	9.8								
Roof knuckle:			8.0	11.8	17.1	8.7	10.4	13.8	12.8				

Exterior coating mil readings:

Roof:	16.7	9.3	6.8	10.4	10.7	14.9	9.1	13.5	10.5		
Roof dollar plate:	9.5	8.2	10.9	8.8	9.2						
Shell 1st ring:	9.6	8.2	9.3	6.0	8.2	7.7	7.9	7.1	8.9	11.1	3.5
Shell 2nd ring:	6.6	11.2	13.8	6.7	4.8	5.3	5.6	6.2	5.3	7.8	7.6

ENGINEERING STRUCTURAL REPORT

RVE *River Valley Engineering, Inc.*

111 North Plaza Court, Van Buren, AR 72956
(479) 410-2208 Fax (479) 410-2440

Project No. :	2011-304	Sioux Falls VA	Page :
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Water Storage Tank Analysis

Tank Data

Location	Sioux Falls, SD
Description	Double Ellipsoid Elevated Water Tower. Sloped Pipe Column Legs.
Year of Construction	1949
Manufacturer	PDM
Size	100,000 Gallons

Roof Analysis

Dome Roof

Required Thickness is 28/200= .14 inches

Since .14 inches < .25

Roof is Acceptable

Top Knuckle Analysis

Required Thickness is (2.6*7*28)/(15000*.85)=.0399 inches

Since .0399 inches < .25 Knuckle is Acceptable

Top knuckle is Acceptable

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Water Storage Tank Analysis (Cont'd)

Shell Analysis

Diameter is 28'-0" and maximum water height is 11'-10"

Check Top Shell

T = (2.6 * 28 * 11.833)/(15000 * .85) = .0675 Inches

Per AWWA the minimum thickness to be used for stability would be .25 inches

Since the actual thickness is .250 inches

The Top Shell Is Adequate

Check Lower Shell

T = (2.6 * 28 * 18.08)/(15000 * .85) = .103 Inches

Per AWWA the minimum thickness to be used for stability would be .25 inches

Since the actual thickness .310 inches

The Lower Shell Is Adequate

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Water Storage Tank Analysis (Cont'd)

Bottom Knuckle Analysis

Maximum water pressure would be (25.083') * 62.4/144 = 10.8694 psi

L/r Ratio is 4 Therfore M = 1.25

T = (10.8694*28*12*1.25)/(15000 * .85+10.8694) = .357 inches

Per AWWA the minimum thickness to be used for stability would be .25 inches

Since the actual thickness is .375 inches

The Bottom Knuckle is Adequate

Bottom Analysis

Dish head with radius of 28'-0" or 336 inches

Maximum water pressure would be (25'-1") * 62.4/144 = 10.8694 psi

From pressure

T = (10.8694*28*12*1.25)/(15000 * .85+10.8694) = .357 inches

From Load

Weight = (pi * 28^2/4) * 25.0833 * 62.4 = 963,774 lb

Load =963,774/(28 * 12 * pi) =913 lb/in

T = 913/(15000 * .85) = .0716 inches

Per AWWA the minimum thickness to be used for stability would be .25 inches

Since actual thickness is .375 inches

The Bottom Bowl is Adequate

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Water Storage Tank Analysis (Cont'd)

Leg Support Analysis

Total Load on each leg would be 934,500 lb/ 4 = 233,625 lb

Laterally Unsupported Length would be 33.667'

Legs are made up of 15" Channels 10" Apart C15 x 40

Area is 23.6 sq in. KL/R = 75

Stress is 233,625/23.6 = 9,899 psi < 15,000 psi

Column Support Legs are Adequate

Check Tower for Wind Loading

Maximum Shear at Base of Columns = 40,400 lb

Maximum Moment at Base of Columns = 3,974,000 ft-lbs

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Water Storage Tank Analysis (Cont'd)

Check Anchors - Diameter at anchors is 51' - 0"

Load per Anchor is (4 * 3,974,000)/(4 * 51 * 4) - 79,000/16 = 14,500 lb

Anchor is 1 inche and thus area of 0.79 sq in

Capacity of Anchor is .79 * 15,000 * 1.33 = 15,700 lb

Anchors are Adequate

Conclusions

The tank for its age is actually in good shape. But unfortunately, steel when in contact with water invariably does corrode and even with the best of maintenance programs, the tank will see some ware.

The roof, bottom, legs, struts, bracing and anchors are all in adequate shape for the continued use of the tank. However, there is at least one Riser Rod that is in need of tightening. Also, to ensure the safety of the tank and those maintaining the tank it is suggested that that the rolling roof ladder be permanently attached to the roof.

PAINT ANALYSIS REPORT

AMERICAN ENGINEERING TESTING, INC.

CONSULTANTS
- ENVIRONMENTAL
- CHEMISTRY
- GEOTECHNICAL
- MATERIALS
- FORENSICS

MAY 12 2011

REPORT OF: TOTAL ANALYSIS

PROJECT: SFVA **DATE:** May 10, 2011

REPORTED TO: MAGUIRE IRON
ATTN: CHAD JOHNSON
1610 NORTH MINNESOTA AVENUE
SIOUX FALLS, SD 57104

LABORATORY NO: 32-00068
Date Received: 05/04/11
Date Sampled: 05/03/11

ANALYTICAL RESULTS

Parameter	SFVA Exterior 11-1573	SFVA Interior 11-1574	MDL	Method*	Date Analyzed
Total Lead	159,000	57	2.0	7420	05/10/11

Date Digested: 05/10/11

MDL –Method Detection Limit
All results are in milligrams per kilogram
* "USEPA SW846,

LABORATORY QUALITY CONTROL

		ACCURACY DATA			PRECISION DATA
Parameter	Sample #	Matrix Spike Percent Recovery	Matrix Spike Duplicate Percent Recovery	Standard Percent Recovery	Relative Percent Difference
Total Lead	ERA	---	---	108%	---

If you have any questions or comments concerning this report, please feel free to contact us.

American Engineering Testing, Inc.

Virginia VerMulm
QA Manager

Dan T. Hanson
Chemistry Manager